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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/623,373	07/18/2003	Eric Aylaian	A-72337/AJT	3183

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EXAMINER

FICK, ANTHONY D

ART UNIT	PAPER NUMBER
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1753

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/04/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/623,373	Applicant(s) AYLAIAN, ERIC	
	Examiner Anthony Fick	Art Unit 1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 January 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-25 and 28-43 is/are pending in the application.
- 4a) Of the above claim(s) 28-43 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12-14, 17-19 and 23-25 is/are rejected.
- 7) ☒ Claim(s) 15, 16 and 20-22 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Newly submitted claims 28 through 43 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: the newly submitted claims require features that are not present within the originally claimed invention, specifically a base and centerline. As the new claims and the original invention are related products with different required features (separate substrates in the original invention, a base with a centerline in the new claims), the newly claimed invention is independent from the original claims.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 28 through 43 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

3. Claims 12 through 14 and 17 through 19 are rejected under 35 U.S.C. 102(a) as being anticipated by JP 2001-196622 (JP '622).

JP '622 discloses a solar collector as shown in figure 1.

Regarding claim 12, figure 1 shows a first substrate, a second substrate and a third substrate (any 3 of the photovoltaic cells 10), and each substrate having a photovoltaic cell formed on a surface thereof. The figure further shows the surfaces of the substrates oriented at angles relative to each other and to a direction of light incident on the collector, and the arrows show the light reflected from a solar cell can be reflected onto the surface of the second and third cells. JP '622 also discloses this configuration improves the power generation efficiency of the device (English abstract).

Regarding claim 13, figure 1 also shows the substrates have an edge proximal to an edge of at least one other substrate.

Regarding claim 14, a polyhedron can be drawn using the surfaces of the solar cells in figure 1, and the solar cells are part of the concave surface.

Regarding claim 17, figure 1 shows a fourth substrate as well, oriented such that light reflected from the first substrate is reflected onto the fourth (in figure 1, the third solar cell from the left is the first substrate, the light reflected is the solid arrow and dotted arrow to the fourth substrate in the very middle of the figure).

Regarding claim 18, figure 1 shows light reflected from all the solar cells onto the central emitter that reflects light back to all the solar cells. Thus the device anticipates the reflection requirements of the claims.

Regarding claim 19, the figure also shows the substrates have edges proximal to the edge of at least one other substrate.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 23 through 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP '622 as applied to claims 12 through 14 and 17 through 19 above, and further in view of King et al. (U.S. 6,586,669).

The disclosure of JP '622 is as stated above for claims 12 through 14 and 17 through 19.

The difference between JP '622 and the claims is the requirement of specific photovoltaic cells.

King teaches different tandem solar cells with improved characteristics. A monolithic cell of King includes multiple junctions comprising a GaInP solar cell, a GaAsSb solar cell, and Ge solar cell (column 4, paragraph 1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the multi-junction monolithic cell of King within the apparatus of JP '622 because the cells of King use multiple layers to improve the output of the device by absorbing different parts of the energy distribution in sunlight (King column 1, paragraph 3) and the cells of King eliminate or reduce the sources of non-ideal losses and bring the device performance closer to theoretical limits (King column

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2, paragraph 1). Because King and JP '622 are both concerned with solar cells, one would have a reasonable expectation of success from the combination.

Regarding claim 23, the solar cells of King are monolithic tandem cells and thus the combination meets the claim.

Regarding claim 24, the solar cells of King comprise a Ge based solar cell, a GaInP based solar cell and a GaAs based solar cell and thus the combination meets the claim.

Regarding claim 25, the solar cells of King are multiple-junction solar cells, thus the combination meets the claim.

Allowable Subject Matter

6. Claims 15, 16, and 20 through 22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. The following is a statement of reasons for the indication of allowable subject matter: the claims require specific geometrical structures formed from the substrates or specific geometrical shapes for the substrates. The shapes and configurations are chosen specifically to provide structure to the solar collectors. While the prior art in the area of solar concentrators has utilized such configurations to capture and concentrate light, these prior art concentrators are just large surface area metals, or other reflective surfaces. The concentrators can be made larger because the reflective material is cheaper than the semiconductor material of the solar cells. The present invention places the more expensive solar cell material as part of the large surface area collector,

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and has to allow reflection off the solar cell for the solar collector to work. The prior art does just the opposite, making the solar cells as small a surface area as possible, and utilizing antireflection coatings to absorb as much light as possible. The geometric configurations of the applicant's present invention with solar cells on each substrate are not known within the prior art and it would not be obvious to alter previous inventions as the prior art teaches away from such modifications. Therefore, while the choices of shape or configuration of the substrates are design choices; in the present context, these choices are not obvious to one of ordinary skill in the art as the conventional devices would not place the solar cells in such configurations or shapes.

Response to Arguments

8. Applicant's arguments with respect to claims 12 through 25 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

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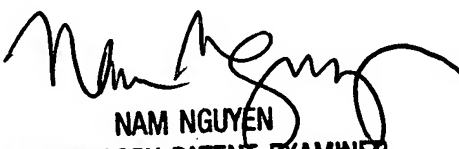
extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony Fick whose telephone number is (571) 272-6393. The examiner can normally be reached on Monday - Friday 7 AM to 4 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Anthony Fick *ADF*
AU 1753
March 29, 2007


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